

# CHERP Policy Brief

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Racial differences in the use of new medical technologies contribute to health disparities.

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## Equity and New Medical Technologies

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*Context:* New medical technologies can improve health outcomes; however, the latest innovations in medicine are not equally available to all patients, and minorities are particularly less likely to receive new medical breakthroughs.

### Background

While not all disparities in health care result in disparities in health outcomes, persistent unacceptable differences in the rates that black and white patients receive new medical technologies such as prescription drugs, implantable devices, and medical procedures have been shown to affect patient health and survival. For example, among cardiac arrest survivors, younger blacks (those between ages 66 and 74) are less likely to receive coronary revascularization or an implantable cardioverter-defibrillator (ICD) and, as a result, do not live as long. In fact, increasing the use of these cardiac procedures among minorities could save many lives per year. Understanding the causes of disparities in the use of new medical technologies is the first step toward their amelioration.

This issue of the Policy Brief summarizes recent CHERP research to identify barriers to the equitable use of new medical technologies.

### Patient Factors

This research project explored whether differences in patients' attitudes toward new technologies—or their *innovativeness*—helps explain whether they will accept a hypothetical new implantable medical device or prescription drug.

### Methods

- Patients in the primary care clinic waiting area of the Philadelphia VA Medical Center completed a survey that measured risk tolerance and attitudes toward new ideas in general as well as medical innovations in particular. The survey also included a vignette describing either a hypothetical implantable cardiac device or a new cardiovascular drug, both designed to reduce the risk of death from heart disease.
- The majority of the respondents were males ages 31 to 85; 101 black and 63 white patients completed the survey. The age, race, and sex distribution was similar to the general population of veterans in most primary care clinics at the medical center.

**While white and black patients had similar levels of general innovativeness, white patients had more favorable attitudes toward trying new medical technologies.**

**Favorable attitudes toward new medical technologies were associated with greater acceptance of new implantable devices among black and white patients.**

**For black patients, but not white patients, the degree of medical technology innovativeness was associated with greater acceptance of a hypothetical new drug.**

## Results

- White patients and black patients had similar scores for general innovativeness. White patients had significantly higher average medical technology innovativeness scores compared to black patients and black race was significantly associated with low medical technology innovativeness. These results persisted after adjusting for differences in patient age, income, education, and comorbidities.
- A higher tolerance for risk was associated with higher scores on the general and medical technology innovativeness portions of the survey. A greater percentage of black patients expressed discomfort with taking risks (15% for black patients vs. 5% among white patients).
- Race was not a significant predictor of attitudes regarding the hypothetical new implantable device. Fourteen percent of blacks compared to 19% of whites were less favorably inclined toward it ( $p=.57$ ). Having poorer health (more than two comorbid conditions) and a higher risk tolerance were associated with more favorable attitudes toward the new medical device. For both black and white patients, higher medical technology innovativeness scores predicted greater acceptance of the device.
- Overall, 31% of black patients versus 19% of white patients were less receptive to the hypothetical new prescription drug ( $p=.003$ ). Higher medical technology innovativeness scores predicted greater acceptance of the hypothetical new drug among black patients. In contrast, among white patients, the level of medical technology innovativeness was unrelated to acceptance of the new drug.

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## Hospital Factors

This research project sought to determine how differences among hospitals in the utilization of new technology contributed to racial disparities over a twelve year period (1989-2000). A second goal was to assess whether the identified racial disparities diminished with time.

## Methods

- The researchers began with 12 years of Medicare Provider Analysis and Review (MEDPAR) data for a randomly selected 20% of the beneficiaries ages 65 years or older. The research team selected 5 new technologies. They linked patient demographic information from Medicare claims data for over 2 million patients who were potentially eligible for these procedures to the records for utilization of these technologies. The new medical technologies assessed in this research are listed below.
  - o **Aortic valve replacements with a tissue valve (bioprosthesis):** This procedure replaces the aortic valve with a valve made of biological tissue. The aortic valve regulates the blood as it leaves the main chamber of the heart.
  - o **Internal mammary artery coronary bypass grafting (IMA-CABG):** This surgery improves blood flow to the heart using an artery from the chest wall.
  - o **Dual-chamber pace maker implantation:** An electronic device implanted into the chest wall that helps regulate the heartbeat by pacing both the atria and the ventricles (upper and lower heart chambers).
  - o **Lumbar-lumbosacral spinal fusion:** Using bone grafts, one or more of the vertebrae of the spine are fused so that motion between them, which can cause severe pain in many patients, no longer occurs.
  - o **Vena cava interruption:** The placement of a filter in the inferior vena cava to trap blood clots and prevent them from entering the lungs.

## Results

- Overall, black patients were less likely to undergo aortic valve replacement, IMA-CABG, dual-chamber pacemaker implantation and spinal fusion than whites. However, black patients were more likely to undergo vena cava interruption.
- Most black patients who were potential technology recipients received their health care at a relatively small number of hospitals. These hospitals provided care for a disproportionate percentage of black inpatients.
- Compared to patients admitted to hospitals with less than 9% black patients, black patients and white patients admitted to hospitals with an inpatient population greater than 20% black had lower rates of aortic valve replacement, IMA-CABG, dual-chamber pacemaker implantation, and spinal fusion. White and black patients admitted to hospitals with greater than 20% black populations were more likely to receive vena cava interruption than those admitted to hospitals with less than 9% black patient populations.
- Additionally, the hospitals with larger black populations had greater degrees of racial disparity in the receipt of the new medical technologies than hospitals with primarily white populations for all of the procedures except vena cava interruption.
- Because vena cava interruption is often the consequence of failed oral anticoagulation therapy, the high use of this procedure at selected hospitals may indicate overuse of the technology as a substitute for pharmacological therapy, and potentially lower quality of care for diseases involving blood clots.
- The racial disparities in the use of these technologies changed minimally over 12 years of data included in this study.

## Implications

Barriers to the equitable use of medical technologies exist at the patient, provider, and health care system level. Eliminating racial disparities in the use of new medical technologies will require interventions at all levels.

Given the relationship between patient attitudes toward new medical technology and its acceptability and use, interventions at the patient level designed to increase medical technology innovativeness among black patient populations could mitigate some racial health disparities. Generally, increasing the availability of information designed to encourage less innovative patients to be more receptive to new, effective therapies may be a first step to broader use. At the same time, care must be taken to ensure that any interventions at the patient level respect individual and cultural preferences for medical treatments.

Increased racial disparities in the utilization of medical technologies within hospitals that serve the greatest number of minorities are troubling. Simple hospital-based tracking interventions, such as monitoring procedure rates by race, for example, might begin to alleviate unacceptable racial differences in their use.

In light of the evidence suggesting there is a technology adoption lag among hospitals that serve large numbers of racial minorities, policy reforms directed at leveling the availability of new technologies across hospitals might reduce this particular health care disparity and bring the U.S. health care system closer to achieving Healthy People 2010 goals of equitable health care delivery.

Reducing health care disparities related to medical technology use is likely to reduce health disparities overall and may inform solutions to inequities in other areas of health care.

***Blacks were less likely to receive all of the new procedures except vena cava interruption.***

***Black patients may be doubly-disadvantaged in their access to medical innovations by receiving care at hospitals that have low rates of new procedures and greater racial disparities.***

This issue of the CHERP Policy Brief is based on the following publications: Groeneveld PW, Heidenreich PA, Garber AM. *Racial disparity in cardiac procedures and mortality among long-term survivors of cardiac arrest*. Circulation. 2003 Jul 22;108(3):286-91.; Groeneveld PW, Laufer SB, Garber AM. *Technology diffusion, hospital variation, and racial disparities among elderly Medicare beneficiaries: 1989-2000*. Med Care. 2005 Apr; 43(4):320-9.; Groeneveld PW, Sonnad SS, Lee AK, Asch, DA, Shea JA. *Racial Differences in Attitudes Toward Innovative Medical Technology*. J Gen Intern Med. 2006 June; 21(6):559-563.

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